



Project Agreement

For the

Acquisition of the

NOAA Research and Development

High Performance Computer Systems

August 9, 2004

I. Background and Purpose

NOAA seeks to acquire advanced High Performance Computing Systems (HPCS) to meet its research and development (R&D) computing requirements with possible options for augmentations to the R&D HPCS to accommodate unforeseen, additional NOAA needs or other partner agency requirements. The new systems will replace or augment the current R&D HPCS at the Geophysical Fluid Dynamics Laboratory (GFDL) located in Princeton, NJ; the Forecast Systems Laboratory (FSL) located in Boulder, CO; and the National Centers for Environmental Predictions (NCEP) located in Camp Springs, MD.

GFDL produces timely and reliable knowledge and assessments on natural climate variability and anthropogenic changes and in the development of the required earth system models. FSL and NCEP conduct applied meteorological research and development to improve and create short-term warning and weather forecast systems, models, and observing technology.

The NOAA mission outcomes that the High Performance Computing (HPC) R&D program supports are:

- Weather and Water Outcome: Enhanced weather and water prediction through interdisciplinary modeling, and ability to expand scope of predictions (e.g. air quality, harmful algal bloom, on-demand hazards runs).
- Climate Outcome: Improved seasonal to interannual diagnosis and prediction; additional Intergovernmental Panel on Climate Change and Climate Change Science Program scenario runs.
- Ecosystem Outcome: New R&D architecture to make extensibility to Coastal and Ocean ecosystem modeling feasible.
- Commerce and Transportation Outcome: Extremely high resolution weather and coastal models that are critical to aviation, marine weather, and navigation.

In order to fulfill the objective of awarding a contract for the R&D HPCS in September 2005, NOAA will utilize the Department of Commerce's re-engineered acquisition process termed CONOPS. That process is described in a document entitled *Department of Commerce Acquisition Process Case for Change*. The CONOPS process was successfully used for all of the recent NOAA HPC acquisitions. The intent of the CONOPS process is to create an acquisition environment that will benefit both the vendor community and the Government. The Government seeks the cooperation of the vendor community in order to conduct business in an atmosphere of integrity, openness, and fairness.

This Project Agreement establishes an agreement between the R&D HPCS Acquisition Team (the Project Team) and the NOAA Chief Information Officer (CIO). The agreement empowers the project team to acquire, deploy, and monitor the systems and

services that comprise the R&D HPCS. The Project Agreement outlines the objectives of the project, Project Team duties, budget availability, and the high-level milestones for the accomplishment of these project objectives.

II. Authority

This project is hereby authorized by the NOAA CIO, the Assistant Administrator for Oceanic and Atmospheric Research, the Director of the National Weather Service and the Director of High Performance Computing and Communications. It is identified as a requirement of the Office of the Chief Information Officer (OCIO), the organization tasked with oversight of NOAA's HPC program.

The R&D HPCS acquisition undertaken by this project requires a Delegation of Procurement Authority (DPA), lasting nine years, from the Department of Commerce.

III. Project Objectives

a. Strive for the best return on investment when acquiring HPC resources

The Project Team recognizes there are finite resources available to support NOAA HPC requirements and these must be maximized in order to provide the highest benefit to NOAA's mission. Striving for the best return on investment supports the Government procuring the best value R&D HPCS to cost-effectively achieve NOAA's mission. Some of the implications of this objective are as follows: (1) NOAA examines a wide range of acquisition strategies to determine the most cost-effective vehicle to acquire HPC resources. This includes considering the implications of selecting options such as: leasing vs. buying, Government vs. contractor facilities, and single vs. multiple NOAA contracts for HPC resources. (2) Appropriate market research is conducted to determine the most cost-effective acquisition strategy. (3) While assessing options, NOAA will complete a cost-benefit analysis for each alternative. This analysis considers all costs associated with meeting the requirement, including telecommunications.

b. Establish a long-term HPC contract to meet NOAA's R&D computing needs

In preparation for acquiring the NOAA R&D HPCS, the Project Team will characterize the NOAA HPC R&D workload, in consultation with other NOAA organizations with HPC systems, and seek concurrence from the NOAA HPC Board. The first system must be delivered in October 2005. The contract will consist of a base period of 49 months, a 48-month option period, and an additional 12-month option period. In order for the first system to be ready for acceptance in December 2005, a contract should be awarded in early September 2005. The total contract term will be September 2005 to September 30, 2014.

c. Sustain NOAA's high level of R&D capability

The NOAA R&D HPCS is more than a collection of three high-speed computers. It includes additional hardware (storage devices and interconnects, communications interfaces, and other peripherals), software (primarily, but not limited to, the operating system, file system, storage management system, system utilities, performance and utilization software, diagnostic tools, and compilers), networking, full system maintenance, support services, and needed supporting infrastructure enhancements. This total system comprises the core computational resource for NOAA's R&D activities. The system provides essential governmental services. Therefore, a key objective of the Project Team is to obtain R&D HPCS that have an adequate level of reliability. Minimum levels of performance will be detailed in the contract. The level of risk will be evaluated for all factors.

d. Phase in new technology to maximize price/performance and minimize risk

One of the objectives of this project is to maintain currency with the rapidly evolving technology of HPCS in a cost-effective manner. At the same time, NOAA seeks to minimize risk associated with frequent technology upgrades and the disruption to R&D operations. As demonstrated in the cost/benefit analysis for the previous NCEP Central Computer System HPC acquisition, it is possible to increase the overall computing capacity of NOAA HPC systems with improved return on investment by adjusting the replacement cycle to match commercial high performance computing technology advances. Based upon past experience, NOAA anticipates a significant technology refresh cycle for each of the delivered systems during the base period and option period. Technologies that allow non-disruptive incremental performance upgrades, between refresh cycles, are desirable.

e. Employ industry standards to measure computing efficiency

The Project Team will ensure the R&D HPCS deliver cost effective computational capability by regularly evaluating their performance with respect to other high performance computers. An annual review process, conducted by a subset of the Project Team, will include an industry survey, consideration of how to best achieve required performance goals via system replacement, enhancement and/or augmentation and a comparison with industry standard measures such as Moore's Law.

f. Provide contracting flexibility to meet customer requirements

HPC R&D models and data assimilation systems are computationally demanding. These computations can run for minutes to months of wall-clock time on hundreds of processors. In addition to fulfilling computational requirements, NOAA requires a high performance storage/retrieval system, support services and contract flexibility to accommodate diverse needs, such as facility leasing/upgrades, application programming support, system augmentations and/or upgrades, visualization support and user

workstations/servers associated with the R&D HPCS. Integrators will be encouraged to compete as prime contractors for this requirement.

IV. Approach

This project will follow the general approach and guidelines established during the CONOPS acquisitions for the current NOAA HPC systems. Based on these experiences, the Project Team will endeavor to provide offerors with sufficient time to work with NOAA's benchmark codes and prepare proposals. A contract option period will be structured to assist offerors in distributing risk. In return, NOAA requires adequate standards for reliability and world-class computational and storage sub-system performance.

The CONOPS process will speed the exchange of information, help assure equal opportunity for all respondents and encourage openness by making as much information as possible available simultaneously to all parties. It is intended to meet the Government's need for computing capabilities by contracting with the private sector. This process makes use of market research to help determine an acquisition strategy and to refine the Government's requirements in relation to the capabilities and approaches of the private sector.

To promote an equitable and active dialog with all members of private industry who may be interested in responding to the stated needs of the Government, electronic communications will be used extensively throughout this solicitation process. Solicitation documents that result from this Project Agreement and the work of the Project Team will be posted publicly on the Internet (<http://rdhpcs.noaa.gov/>). A second private site will be established for use by the acquisition team members only.

Conveying a sense of equity across NOAA R&D is integral to the success of the acquisition and achieving the larger NOAA HPC strategy. Accordingly, the Project Team will openly address equity as part of its work and ensure that the team reflects all relevant stakeholders and organizations. Additionally, the HPC Board and project team members have committed to create an environment in which team members feel that they have been heard, that the process used is fair and that they can live with the outcomes. The HPC Board and team members will share this message with their respective stakeholders to achieve full buy-in.

V. Project Team Membership

The R&D HPCS Project Team consists of a Project Management Team and a Core Team that provides the steering and decision-making authority for the project.

The selection and assignment of the team members has been made on the basis of cross-functional needs and includes a warranted contracting officer. Additionally, the advisors include an information technology analyst, a budget analyst, a representative from the Office of the General Counsel, Line Office and Goal Team representatives, and a DoC risk management specialist.

There are associate members and advisors who are non-government employees. These individuals, as well as the government employees, will be required to sign non-disclosure agreements. The employers of the non-government employees will be required to submit a letter indicating that they will not be associated with any vendor proposals.

VI. Empowerment and Management Review

Subject to approval by the Source Selection Official, the Project Team is hereby authorized to take all steps necessary for the acquisition of the NOAA R&D HPCS, including related hardware, software, additional infrastructure, and support services. The Project Team will make technical and business recommendations to the Source Selection Official prior to the key scheduled milestones noted below. No authorizations other than those already obtained or described will be required.

The Project Team is empowered to conduct any acquisitions necessary to support the R&D HPCS procurement. This includes complete authority to conduct micro purchases, purchase card acquisitions, and contracting by other methods, within the budgetary limits described in the Project Agreement. All contracts will be executed by a warranted Contracting Officer who is a member of the Project Management Team.

The Project Team will fulfill its responsibilities with respect to management oversight by conducting briefings to the Senior Executive Advisory Board and obtain approval from the Source Selection Official immediately prior to the following key actions:

<u>Actions</u>	<u>Schedule Completion</u>
1. Finalize Project Agreement	August 2004
2. Publish RFI	August 2004
3. Release RFP	December 2004
4. Competitive range determination/Down-select	April 2005
5. Contract Award	September 2005
6. Delivery of initial system	October 2005
7. System Acceptance	60 days after delivery

The briefings will include a review of project milestones and an update of the state of the budget supporting the R&D HPCS. The briefings will also provide a forum to address other issues of interest to senior management. It should be noted that all participants in the management reviews will be required to sign non-disclosure and conflict of interest agreements before the review can be held.

It is the intent of the parties to this Project Agreement that, except under unusual circumstances, no additional reviews or documentation will be required. The Project Team includes DoC and NOAA advisors who will participate throughout the acquisition process. This on-going interaction will serve in lieu of reviews and clearances by the DoC and NOAA.

The following planning documents form the basis for the activities of this project and will be provided publicly:

- NOAA Strategic Plan
- NOAA Strategic IT Plan
- NOAA HPC Strategy and Roadmap

The following documents will also be provided publicly by the Project Team during the course of this acquisition:

- Project Agreement
- Solicitation, including Statement of Need and all Amendments

While protecting vendor confidentiality, management will have complete access to the Internet facilities maintained by the Project Team. In addition, management will be granted access upon request to procurement sensitive documents maintained on a secure intranet. The Internet and intranet facilities together will contain the most recent drafts of all pertinent documents. The Project Team will inform the Senior Executive Advisory Board of significant deviations from the acquisition milestones that may affect the planned award in September 2005 or the month in which the initial system is expected to be accepted.

VII. Estimated Value

The total planned value of the R&D HPCS Acquisition Project for the 49-month base period (September 2005 - September 2009) is estimated to range from \$57M - \$108.5M. The four-year option period (2009 - 2013) is estimated to range from \$72M - \$140M. The additional 1 year option period (2013 - 2014) is estimated to range from \$18 - \$35M. The entire R&D acquisition has an estimated total value of between \$147M and \$283.5M. The funding contributions for this acquisition come from three primary sources: the development portion of the Weather and Climate supercomputing budget, GFDL, and the High Performance Computing and Communications program. This

budget profile is consistent with the funding levels included in the FY05 President's Budget for these accounts and includes other potential funding sources.

Funding is planned for the 109-month period (September 2005 - September 30, 2014) and will be subject to the availability of funds provided through the annual appropriation process. This level of funding is required to acquire appropriate computer system resources, including all system maintenance, support, and system enhancements. The following is the annual breakdown of the funding planned (but not guaranteed) for this acquisition. No less than 94% of the annual funding will be dedicated to the components of the NOAA R&D HPCS specified in the RFP. Under direction from the Government, the remaining funds will be used by the Contractor to refine key areas of the NOAA R&D HPCS, or other aspects of a particular site's computing environment covered under the scope of the contract, that will improve performance, efficiency, or usability of the overall system. These areas may include, but will not be limited to, node, disk, or memory upgrades; visualization, server, and desktop capabilities; supporting network infrastructure; and additional support. Key areas will be identified on an as-needed basis by performance assessments, including an annual system performance review by the Government. The Government and the NOAA R&D HPCS Contractor will work together to identify the necessary items that will best meet NOAA's computing needs. Actual purchases for this purpose will be determined solely by the Government.

Funding profile for Research & Development (Base + Options)

Fiscal Years	2006	2007	2008	2009	2010	2011	2012	2013	2014
Equipment Acquisition and Maintenance	\$3-3.5	\$18-35	\$18-35	\$18-35	\$18-35	\$18-35	\$18-35	\$18-35	\$18-35

(Dollars in millions)

Included in this procurement is an option to the R&D contract to provide additional computational resources to the R&D HPCS in the event that new NOAA requirements must be met or NOAA establishes partnerships with other Federal Agencies to provide them with HPC resources. This option may be exercised at any time during the life of the R&D contract. The estimated total value of this option is \$90M.

VIII. Milestones

The overarching goal of this project is to take all steps necessary to provide for the timely acquisition and continued availability of computational resources for NOAA's R&D mission, including related hardware, software, and support services. To ensure that the capabilities of this system will be available when needed, the Project Team plans to

award the R&D contract in September 2005. This contract will call for the subsequent delivery and installation of a system in October 2005.

The following milestones present an overview of the project schedule.

Issue Preliminary FedBizOps announcement	July 2004
Finalize Project Agreement	August 2004
Publish RFI (Draft SON/preliminary benchmark codes)	August 2004
Meet w/vendors to discuss RFI	October 2004
Secure DPA	November 2004
Issue pre-solicitation FedBizOps synopsis	November 2004
Release final benchmark codes	December 2004
Release RFP	December 2004
Hold pre-proposal conference	December 2004
Receive initial vendor proposals	February 2005
Complete competitive range determination/Down-select	April 2005
Conduct LTDs and vendor discussions	May 2005
Receive revised proposals	June 2005
Conduct negotiations with vendors	July 2005
Receive final proposal revisions	August 2005
Award contract	September 2005
Delivery of initial system	October 2005
System acceptance	60 days after delivery
Annual system performance review	October 2006
Annual system performance review	October 2007
Annual system performance review	October 2008
Annual system performance review	October 2009

IX. Term

The project begins at the date of the approval of this document and concludes when the final R&D HPCS is removed from operations. The contract base period of performance is projected to be 49 months with a 48-month option period and an additional 12-month option period for a total of 109 months.

X. Performance Goals and Measures

This project activity has clearly defined performance requirements as well as fiscal and temporal constraints. Maintaining the acquisition schedule described herein is the highest priority for the Project Team.

In order to meet NOAA's performance requirements, the computational capability of the proposed R&D HPCS will be measured by carefully reviewing demonstrated performance on a suite of NOAA benchmark programs and evaluating the system's

ability to meet NOAA's daily R&D workload. The benchmarks will measure data storage and retrieval functions as well as raw computational performance. Once the R&D HPCS are installed and operational, the Project Team will ensure the continuing acceptability of these systems and verify that their utilization supports all pertinent R&D schedules and appropriate scientific goals.

Performance monitoring during the life of the system will be continuous. Sufficient system resources to achieve NOAA's R&D goals are required not less than 96 percent of the contract-prescribed available time.

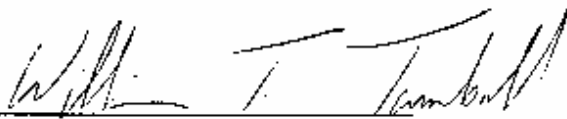
During the life of the R&D HPCS, the Project Team will conduct annual reviews of the systems in order to consider their performance and to evaluate opportunities for extending their capabilities. System upgrades must be available within the initial budget constraints of this acquisition. The review process, which will result in decisions on how best to enhance overall performance, will begin within one year of system acceptance.

XI. Execution



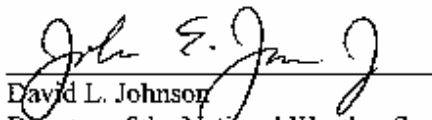
Carl P. Staton
Chief Information Officer,
NOAA

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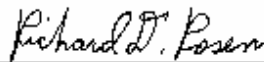
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